

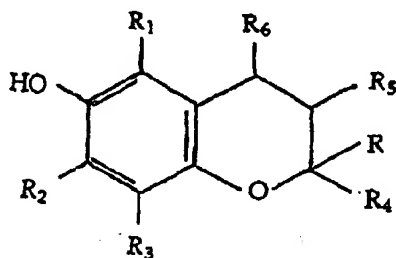
AMENDMENTS TO THE CLAIMS

The listing of claims will replace all prior versions, and listing, of claims in the application. Please make the following amendments to the claims:

Please cancel claims 1-45 currently on file.

Please add the following new claims:

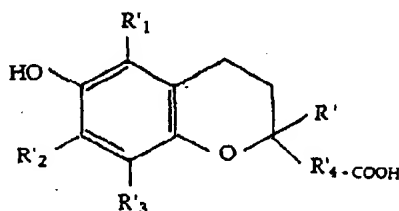
46. (New) A chemical composition having oxygen transporting capability and comprising a biocompatible hemoglobin capable of oxygen transport chemically bonded to a chromanol antioxidant.
47. (New) A chemical composition according to claim 46 consisting essentially of the reaction product of hemoglobin and a 6-hydroxy chroman compound having antioxidant properties and corresponding to the general formula:



where each of R₁, R₂, and R₃ is independently selected from H, C₁ - C₈ alkyl and (CH₂)_n X where n is an integer from 0 to 20; each of R, R₄, R₅ and R₆ is independently selected from H, C₁ - 20 alkyl, X and - (CH₂)_mX where m is an integer from 0 - 20; and X is a substituent containing a reactive functional group selected in conjunction with the hemoglobin so as to be capable of reaction therewith to effect chemical linkage of the hemoglobin to the chroman compound; with the proviso that the chroman compound includes at least one functional group X.

48. (New) The chemical composition of claim 47 wherein the substituent X contains a functional group capable of reacting with amino acid residues of the protein chains of the hemoglobin.

49. (New) The composition of claim 48 wherein the substituent X contains a functional group selected from halo, carboxyl, amino, hydroxyl, thiol, azide, azo, aldehyde and phosphate.
50. (New) The composition of claim 47, wherein the chromanol is a chromanol carboxylic acid corresponding to the general formula:



- where R' is H or an alkyl radical of 1-20 carbon atoms and R₁, R₂ and R₃ are independently selected from H and C₁-C₄ alkyl, and R₄ is a direct bond or C₁ - 8 alkyl chain.
51. (New) The composition of claim 50 wherein the composition is a covalently linked conjugate of said antioxidant chromanol and human hemoglobin.
52. (New) The composition of claim 46 wherein the hemoglobin of the conjugate is modified by a cross-linking agent.
53. (New) The composition of claim 52 wherein the hemoglobin is at least partially stabilized by said cross-linking agent to form stabilized tetrameric units.
54. (New) The composition of claim 53 wherein the hemoglobin of the conjugate is at least partially oligomerized into oligomers of up to twelve stabilized tetrameric units.
55. (New) The composition of claim 54 comprising a mixture of tetrameric stabilized hemoglobin units conjugated to the chromanol antioxidant and oligomers of from 2 - 8 such stabilized hemoglobin units conjugated to the chromanol antioxidant.
56. (New) The composition of claim 55 wherein the hemoglobin is modified or cross-linked with a polyaldehyde, glutaraldehyde, a diaspirin compound, a pyridoxyl compound or a trimesoyl compound.

57. (New) The composition of claim 56 wherein the hemoglobin is cross- linked with a polyaldehyde derived from oxidative ring-opening of a polysaccharide.
58. (New) The composition of claim 57 wherein the polysaccharide is raffinose.
59. (New) The composition of claim 46 wherein the hemoglobin-antioxidant conjugate is bonded to a biocompatible polymer.
60. (New) The composition of claim 59 wherein the biocompatible polymer is polyethylene glycol, a polysaccharide, a polyamino acid, or an insoluble support.
61. (New) The composition of claim 50 wherein, in the formula of the chroman carboxylic acid, at least one of R' ₁, R' ₂ and R' ₃ is methyl.
62. (New) The composition of claim 61 wherein, in the formula of the chroman carboxylic acid, R' ₄ is a direct bond.
63. (New) The composition of claim 62 wherein the chroman carboxylic acid antioxidant is 2,5,7,8-tetramethyl-2-carboxy- chroman-6-ol.
64. (New) A chemical composition having oxygen transporting capability and comprising a biocompatible hemoglobin capable of oxygen transport chemically bonded to Trolox.
65. (New) The composition of claim 64 wherein the hemoglobin is intramolecularly cross-linked.
66. (New) The composition of claim 65 wherein the hemoglobin is intramolecularly crosslinked with oxidized raffinose.
67. (New) The composition of claim 65 wherein the hemoglobin is intramolecularly and intermolecularly cross-linked.

68. (New) The composition of claim 64 wherein the hemoglobin is deoxyhemoglobin
69. (New) The composition of claim 64, wherein the hemoglobin is carboxyhemoglobin.
70. (New) The composition of claim 64 wherein the Hb:Trolox ratio is 1:1 – 1:3.7.
71. (New) The composition of claim 64 wherein the human hemoglobin conjugated with Trolox has a P50 of 41 mm Hg.
72. (New) The composition of claim 64 wherein the human hemoglobin conjugated with Trolox has a P50 of 40 mm Hg.
73. (New) The composition of claim 64 wherein the human hemoglobin conjugated with Trolox has a P50 of 16 mm Hg.